PLAY & LEARN

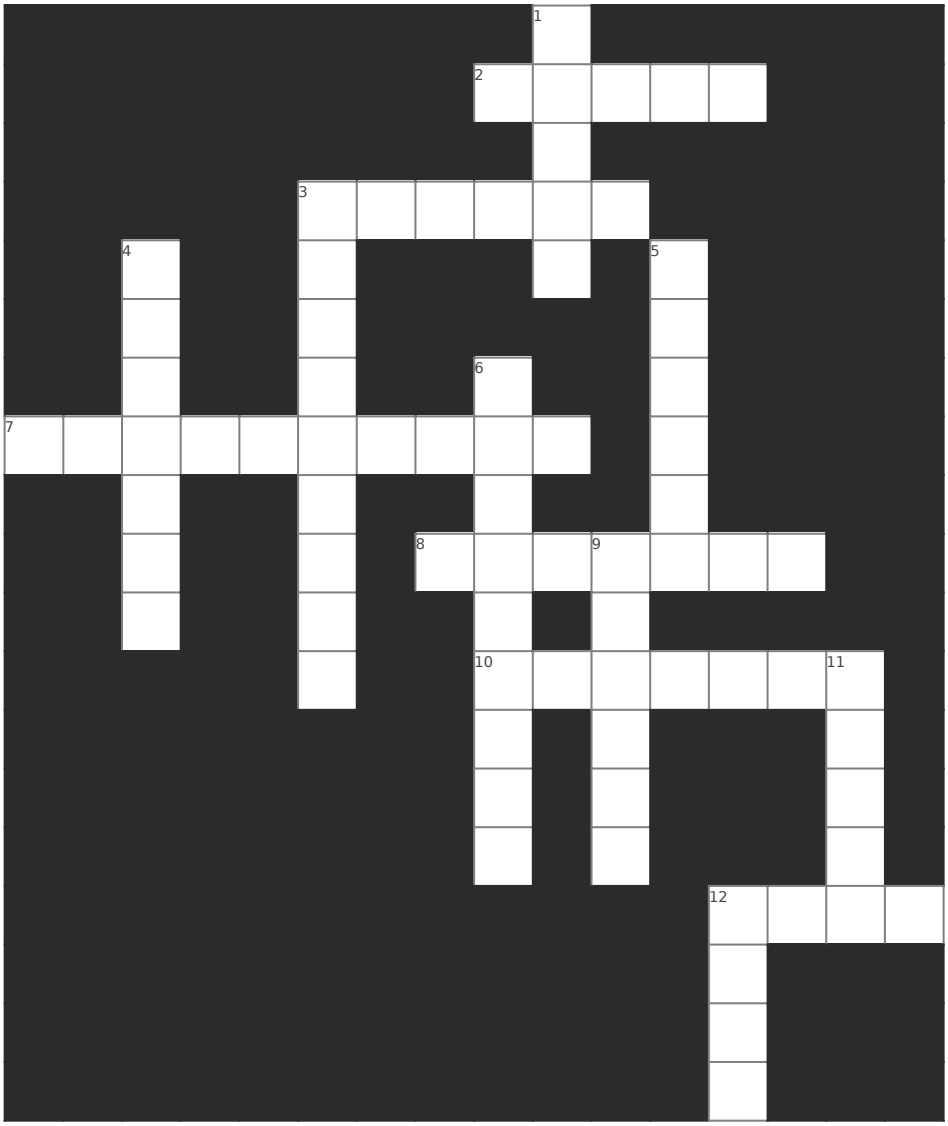
A puzzle workbook — crosswords, word searches, scrambles and quiz games

Print it. Solve it. Race a friend. Answer keys are at the back — no peeking.

#	Puzzle	Play it	Time
1	The Crossword	Solo or pairs	15 min
2	Word Search	Solo — race the clock	10 min
3	Scrambled Terms	Solo	8 min
4	Odd One Out	Teams of 4	10 min
5	Chapter Scrabble	Groups of 3–4	20 min
6	Who Am I? — Clue Cards	Whole class	15 min
7	True or False Sprint	Whole class, standing	6 min
8	Bingo	Whole class	15 min
9	Two Truths and a Lie	Pairs	10 min
10	The Escape Challenge	Teams of 4	25 min

Puzzle 1 · The Crossword

Every answer is a word from this chapter. Fill the white squares — one letter per square.



ACROSS

2. the SI unit of work and energy (5)

3. a wheel-and-rope simple machine that changes force direction (6)

7. ____ energy — kinetic plus potential (10)

8. ____ energy — energy of motion (7)

10. ____ energy — heat energy (7)

12. force times displacement in the direction of force (4)

DOWN

1. the rate of doing work (5)

3. gravitational ____ energy — energy of position (9)

4. the fixed pivot point of a lever (7)

5. the force you apply to operate a simple machine (6)

6. a mode of heat transfer needing no medium (9)

9. the capacity to do work (6)

11. a simple machine that rotates about a fulcrum (5)

12. the SI unit of power (4)

Bonus words that did not fit the grid — define each one in a sentence: LOAD

Puzzle 2 · Word Search

16 terms are hiding in the grid — across, down, diagonally, and backwards. Circle each one, then tick it off the list. Beat 10 minutes and you win.

L	T	I	L	G	E	C	L	T	H	E	R	M	A	L
Y	T	Y	E	I	B	Y	A	C	V	Z	G	H	R	K
K	A	L	V	L	Y	J	I	A	F	V	M	F	I	C
P	W	H	E	G	W	B	T	K	X	F	U	U	W	J
I	L	Z	R	N	V	V	N	R	P	U	Z	L	A	S
T	W	E	P	E	I	U	E	D	Q	B	A	C	W	D
K	N	P	L	O	K	G	T	P	C	W	R	R	X	I
E	I	U	T	R	B	J	O	U	Y	I	A	U	Q	F
A	O	N	O	K	Q	H	P	L	G	D	T	M	S	U
J	K	W	E	O	D	H	W	L	L	E	B	C	O	D
Q	E	Z	H	T	Q	Y	R	E	W	O	P	G	U	A
I	Y	Q	W	E	I	V	J	Y	Q	I	N	C	N	O
O	E	R	A	L	A	C	S	Y	S	G	I	K	D	L
H	Z	Y	Z	G	A	T	F	D	V	X	P	N	W	E
F	N	K	G	C	N	R	M	O	E	F	F	O	R	T

☐ POTENTIAL	☐ KINETIC	☐ FULCRUM
☐ THERMAL	☐ ENERGY	☐ EFFORT
☐ PULLEY	☐ TARAZU	☐ POWER
☐ JOULE	☐ LEVER	☐ SOUND
☐ WORK	☐ LOAD	☐ WATT
☐ HEAT		

Race Rules

- **Solo:** find all the words. Note your time at the top of the page.
- **Pairs:** one partner finds across-and-down words, the other finds diagonals. First pair to complete the list wins.
- **Hard mode:** cover the word list. Find as many chapter terms as you can in 5 minutes.
- **Champion move:** for every word you find, say what it means out loud. No meaning, no point.

Puzzle 3 · Scrambled Terms

Every row is a chapter word with its letters shuffled. Unscramble it. The clue in brackets is your lifeline — try to solve without it first.

#	Scrambled letters	Clue	Your answer
1	A I M A L N C C H E	(kinetic plus potential energy combined)	_____
2	T A V A I L O N R I A G T	(____ potential energy — depends on height)	_____
3	F C Y I N F E E I C	(how much useful output a machine gives for its input)	_____
4	R M C L U U F	(the fixed pivot of a lever)	_____
5	R A I O D A I T N	(heat transfer that needs no medium at all)	_____
6	U O T I D N C C O N	(heat transfer through direct contact)	_____
7	I E O C V N C O N T	(heat transfer through a moving fluid)	_____
8	L D C I E N I N	(____ plane — a ramp that is a simple machine)	_____

Make It a Game

Beat the Bell: the teacher sets a 60-second timer. Every unscrambled word inside the bell = 1 point; a word you can also *define* = 3 points.

Chain Scramble: in a circle, each student scrambles a chapter word for the person on their left. Miss it and you are out. Last student standing wins.

Puzzle 4 · Odd One Out

Three belong together. One does not. Circle the odd one — then write why in one line. The "why" is where the marks are.

#	Which is the odd one out?	Because…
1	Kinetic energy · Potential energy · Thermal energy · Fulcrum	_____
2	Lever · Pulley · Inclined plane · Thermometer	_____
3	Joule · Watt · Newton · Metre (energy-related units)	_____
4	Effort · Load · Fulcrum · Radiation	_____
5	Conduction · Convection · Radiation · Reflection	_____
6	Work · Energy · Power · Colour	_____

Puzzle 5 · Chapter Scrabble

Play in groups of 3–4. You have one shared rack of letter tiles. Build only terms from this chapter — no ordinary English words allowed.

Your tile rack — cut these out or write them on paper squares:

A 1	**B** 3	**C** 3	**D** 2	**E** 1	**G** 2	**H** 4
I 1	**L** 1	**M** 3	**N** 1	**O** 1	**P** 3	**R** 1
S 1	**T** 1	**U** 1	**V** 4	**X** 8	**Y** 4	**Z** 10

Scoring:

You did this	Points
Each letter tile used	Its tile value
Word is a term from this chapter	× 2
Word is 8 letters or longer	+ 10 bonus
You can state its meaning correctly	+ 5
You can connect it to a real-life example	+ 3
Word is *not* in this chapter (challenged and lost)	− 5

How a Round Works

1. Player builds a word from the rack and lays it down.
2. Any opponent may **challenge** within 10 seconds: "That's not in this chapter."
3. Open the textbook. If the challenger is right, the word is removed and the builder loses 5 points. If the challenger is wrong, the *challenger* loses 5 points.
4. Builder states the meaning to claim the +5 bonus. The group votes on whether it was correct.
5. Play 6 rounds. Highest total wins.

Target Words (worth the most — do not show your opponents)

MECHANICAL · GRAVITATIONAL · EFFICIENCY · RADIATION · CONDUCTION · CONVECTION · FULCRUM · POTENTIAL

Puzzle 6 · Who Am I? — Clue Cards

Cut along the lines. One student draws a card and reads only the first clue aloud; the class guesses. Wrong guess? Read clue 2. Fewer clues used = more points.

CARD 1 ① I am force times displacement in the direction of the force. ② Pushing a wall with no movement means I am zero. ③ I am work.	**CARD 2** ① I am the capacity to do work. ② I can be kinetic or potential. ③ I am energy.
CARD 3 ① I am the energy a moving object has. ② A speeding car has plenty of me. ③ I am kinetic energy.	**CARD 4** ① I am the energy stored due to position. ② Water behind a dam has plenty of me. ③ I am (gravitational) potential energy.
CARD 5 ① I am the rate of doing work. ② My SI unit is the watt. ③ I am power.	**CARD 6** ① I am the fixed pivot of a lever. ② A see-saw balances around me. ③ I am the fulcrum.
CARD 7 ① I am the force you apply to a machine. ② I am usually smaller than the load, thanks to mechanical advantage. ③ I am effort.	**CARD 8** ① I am the resistance a machine works against. ② A heavy box you are lifting is an example of me. ③ I am load.
CARD 9 ① I change the direction of a force using a wheel and rope. ② A flag is hoisted using me. ③ I am a pulley.	**CARD 10** ① I am heat transfer with no medium needed at all. ② Sunlight reaches Earth through me. ③ I am radiation.
CARD 11 ① I am heat transfer through direct touching. ② A metal spoon in hot tea heats up by me. ③ I am conduction.	**CARD 12** ① I am heat transfer through the movement of a fluid. ② Boiling water circulates by me. ③ I am convection.

Scoring: guessed after clue ① = **5 points** · after ② = **3 points** · after ③ = **1 point**

Puzzle 7 · True or False Sprint

Everyone stands. Teacher reads a statement. True → stay standing. False → sit down. Get it wrong and you are out. Last student standing wins.

#	Statement	Your call
1	Work is done only when a force causes displacement.	☐ True ☐ False
2	Pushing hard against an immovable wall means you do a large amount of work.	☐ True ☐ False
3	Kinetic energy is the energy of motion.	☐ True ☐ False
4	Potential energy depends only on speed, not position.	☐ True ☐ False
5	Power is the rate of doing work.	☐ True ☐ False
6	The SI unit of power is the joule.	☐ True ☐ False
7	A lever always has a fulcrum.	☐ True ☐ False
8	In a lever, effort is always larger than load.	☐ True ☐ False
9	Radiation needs a medium to transfer heat.	☐ True ☐ False
10	Conduction transfers heat through direct contact.	☐ True ☐ False
11	Convection involves the bulk movement of a fluid.	☐ True ☐ False
12	Mechanical energy is the sum of kinetic and potential energy.	☐ True ☐ False
13	A pulley can change the direction of an applied force.	☐ True ☐ False
14	The SI unit of energy is the same as the SI unit of work.	☐ True ☐ False

Puzzle 8 · Bingo

Each student fills the empty grid below with any 16 words from the word bank — in any order, one per box. The teacher then reads out meanings, not names. Cross a box only when its meaning is called. First to a full row, column or diagonal shouts BINGO.

Word bank — choose any 16:

Work	Energy	Kinetic energy	Potential energy
Power	Fulcrum	Effort	Load
Pulley	Lever	Joule	Watt
Radiation	Conduction	Convection	Mechanical energy

Your bingo card:

Caller’s List (teacher only — read the meaning, never the name)

① "I am force times displacement in the direction of force." ② "I am the capacity to do work." ③ "I am the energy of motion." ④ "I am the energy stored due to position." ⑤ "I am the rate of doing work." ⑥ "I am the fixed pivot point of a lever." ⑦ "I am the force applied to operate a machine." ⑧ "I am the resistance a machine works against." ⑨ "I change the direction of force using a wheel and rope." ⑩ "I am heat transfer needing no medium." □ "I am heat transfer through direct contact." □ "I am heat transfer through a moving fluid." □ "I am kinetic plus potential energy combined."

Puzzle 9 · Two Truths and a Lie

Each set has three statements. Two are true, one is a lie. Circle the lie — and correct it in one line.

Set 1

(a) Work is zero if there is no displacement.

(b) Work is force times displacement.

(c) Pushing a wall that does not move counts as a lot of work.

The lie is _____ . Corrected: _____

Set 2

(a) Potential energy depends on height.

(b) Kinetic energy depends on speed.

(c) Kinetic energy depends on height, not speed.

The lie is _____ . Corrected: _____

Set 3

(a) The SI unit of power is the watt.

(b) The SI unit of work is the joule.

(c) The SI unit of power is the joule.

The lie is _____ . Corrected: _____

Set 4

(a) Radiation needs a medium.

(b) Conduction needs direct contact.

(c) Convection needs a fluid to move.

The lie is _____ . Corrected: _____

Puzzle 10 · The Escape Challenge

Solve all five gates. Each gives you one digit. Collect all five to unlock the exit code.

□ GATE 1 — The Work Gate

Work = Force × Displacement. Count the words in that formula's name (force, displacement = 2 words). Use that number.

Digit: □

□ GATE 2 — The Energy Gate

How many main types of mechanical energy are named (kinetic + potential)? Use that number.

Digit: □

□ GATE 3 — The Heat Gate

How many modes of heat transfer are there (conduction, convection, radiation)? Use that number.

Digit: □

□ GATE 4 — The Machine Gate

Count the letters in LEVER.

Digit: □

□ GATE 5 — The Power Gate

Count the letters in WATT.

Digit: □

EXIT CODE: □ □ □ □ □

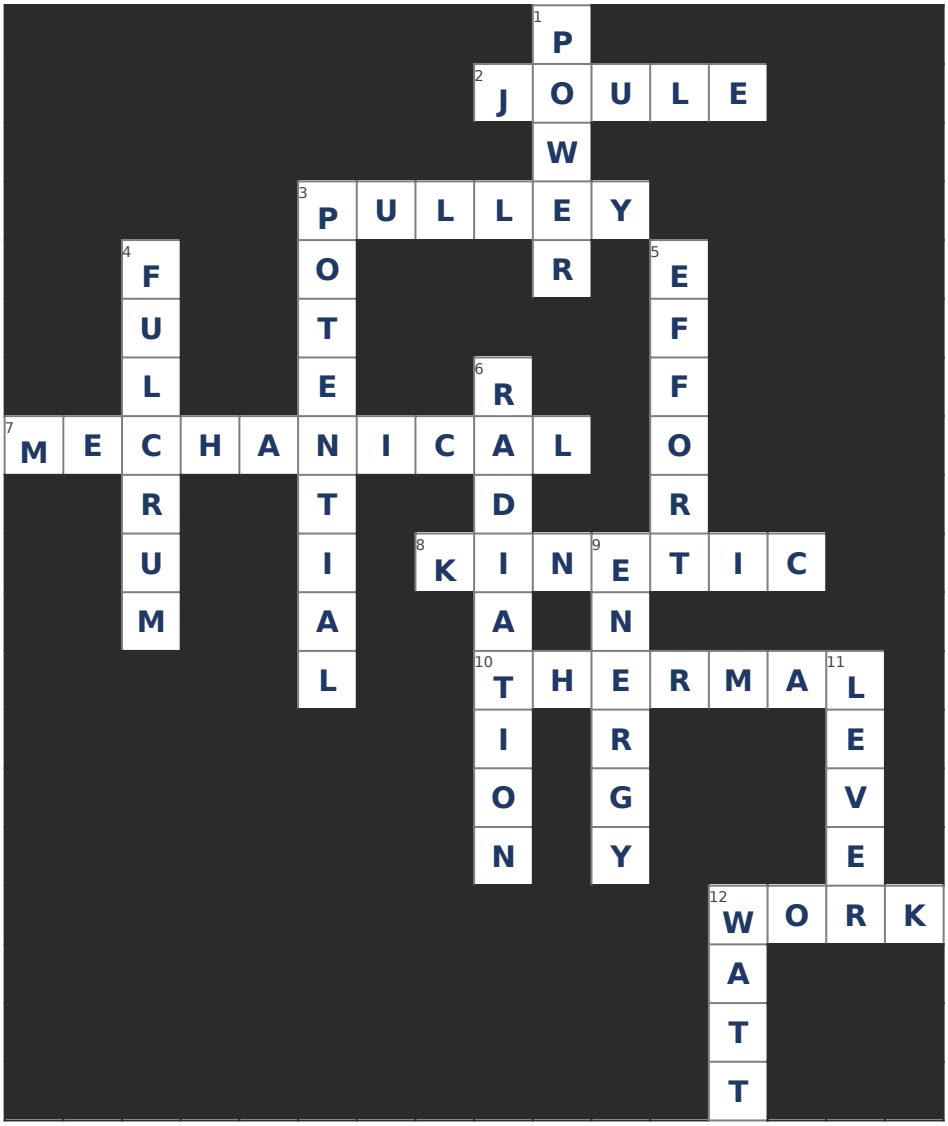
□ Teacher's note

Hide the gate cards around the classroom. Teams rotate every 4 minutes. First team to reach the door with the correct code escapes. Losing teams try again next period.

Answer Keys

Teachers and self-checkers only. Solve first — the puzzle is the point.

Puzzle 1 · Crossword — Solved Grid



Across: 2 JOULE · 3 PULLEY · 7 MECHANICAL · 8 KINETIC · 10 THERMAL · 12 WORK

Down: 1 POWER · 3 POTENTIAL · 4 FULCRUM · 5 EFFORT · 6 RADIATION · 9 ENERGY · 11 LEVER · 12 WATT

Puzzle 2 · Word Search — Solved Grid

L	**T**	I	**L**	G	E	C	**L**	**T**	**H**	**E**	**R**	**M**	**A**	**L**
Y	**T**	Y	**E**	I	B	Y	**A**	C	V	Z	G	H	R	K
K	**A**	L	**V**	L	**Y**	J	**I**	A	F	V	M	**F**	I	C
P	**W**	H	**E**	**G**	W	B	**T**	K	X	F	**U**	**U**	W	J

I	L	Z	**R**	N	V	V	**N**	R	P	U	**Z**	**L**	A	S
T	W	**E**	P	**E**	I	U	**E**	D	Q	B	**A**	**C**	W	D
K	**N**	P	**L**	O	**K**	G	**T**	**P**	C	W	**R**	**R**	X	I
E	**I**	**U**	T	**R**	B	J	**O**	**U**	Y	I	**A**	**U**	Q	F
A	**O**	**N**	**O**	K	Q	H	**P**	**L**	G	D	**T**	**M**	**S**	U
J	K	**W**	**E**	O	D	H	W	**L**	L	E	B	C	**O**	**D**
Q	E	Z	**H**	**T**	Q	Y	**R**	**E**	**W**	**O**	**P**	G	**U**	**A**
I	Y	Q	W	**E**	**I**	V	J	**Y**	Q	I	N	C	**N**	**O**
O	E	R	A	L	**A**	**C**	S	Y	S	G	I	K	**D**	**L**
H	Z	Y	Z	G	A	**T**	F	D	V	X	P	N	W	E
F	N	K	G	C	N	R	M	O	**E**	**F**	**F**	**O**	**R**	**T**

Puzzle 3 · Scrambled Terms

1. MECHANICAL · 2. GRAVITATIONAL · 3. EFFICIENCY · 4. FULCRUM · 5. RADIATION · 6. CONDUCTION · 7. CONVECTION · 8. INCLINED

Puzzle 4 · Odd One Out

#	Odd one	Because
1	Fulcrum	the other three are forms of energy; fulcrum is a lever's pivot point
2	Thermometer	the other three are simple machines; a thermometer measures temperature
3	Metre	joule, watt and newton are all related to work/energy/force; metre measures distance
4	Radiation	effort, load and fulcrum are all lever concepts; radiation is a heat-transfer mode
5	Reflection	conduction, convection and radiation are the three heat-transfer modes; reflection is not one of them
6	Colour	work, energy and power are all physical quantities in this chapter; colour is not

Puzzle 7 · True or False Sprint

1-T · 2-F · 3-T · 4-F · 5-T · 6-F · 7-T · 8-F · 9-F · 10-T · 11-T · 12-T · 13-T · 14-T

Puzzle 9 · Two Truths and a Lie

Set	The lie	Correction
1	c	If there is no displacement, work done is zero, regardless of how hard you push.
2	c	Kinetic energy depends on speed (and mass), not height — that is potential energy.
3	c	The joule is the unit of work/energy; the watt is the unit of power.
4	a	Radiation is the one heat-transfer mode that needs no medium at all — that is how sunlight reaches Earth.

Puzzle 10 · The Escape Challenge

EXIT CODE: 2 · 2 · 3 · 5 · 4

(Answer: 2) (Answer: 2) (Answer: 3) (Answer: 5) (Answer: 4)

Now go find a lever, a pulley and an inclined plane somewhere in your own home. ⚙